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The Responsibility of the Surgeon to the Aged Patient

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THE Ulster Medical Society was formed in 1866 to further medical knowledge. It must not be lost sight of that dissemination of new knowledge and thought must be universal and then accepted before it can be considered a true advance. The work of the laboratory must pass beyond its limits to be clinically tested in the hospital wards and finally approved in general practice before it is considered a true advance in medicine. It is here in this Society that the laboratory worker, the consultant, and general practitioner mingle, discuss, and determine an advance. As President succeeds President, there is the thought that in that interval some new problem is being investigated and some advance recorded. It seemed to me fitting then that I might address you on a subject in which there has been a little advance and in which further problems are being confronted, and one which must become more important to surgeons in the future, namely, the surgeon's responsibility in the treatment of the older age groups. Each branch of medicine is dependent upon the other; as one section develops it throws upon the other the responsibility to make a commensurate advance. Old age is the result of advances in all branches of medicine, including hygiene and social medicine, so that surgeons must seek to play their part.

In Northern Ireland, with an estimated total population in 1964 of 1,432,900 total inhabitants, there will be :—

Females over 60 - - - -	116,000
Males over 65 - - - -	75,000
	191,000

Hitherto the benefits of surgery have often with complacency been denied to the aged, thinking that the patient had already had a long life and the risk of operation so great that it was not justified. But the span of any life cannot be accurately estimated, and even a few months of life may be valuable. It it could be foreseen that one of us was to die in two years' time from an accident it would not justify a surgeon refusing to-day to sew up in us a perforated ulcer or remove an acute appendix. Old age has its rights as well as youth. Too old at 40 is a misnomer—66 per cent. of worthwhile world accomplishments have been done by people over 60. Saint Patrick was over 60 years when he came to Ireland on his mission of Christianity, and Franz Hals was over 80 before he thrust immortality upon the syndics of the almshouses of Haarlem, and it was after 80 years of age that Rembrandt portrayed most poignantly on canvas the joys and sorrows of the human soul. In our own age we have only to think of statesmen like Adenauer and Winston Churchill. These might say :—

"Grow old along with me!
The best is yet to be,
The last of life, for which the first was made."

Undoubtedly, many come to hospital to whom "Youth was a blunder, Manhood a struggle, and Old Age a regret," but even they have their personal rights.

Because those intrepid sailors, the Phœnicians, kept secret their methods of navigation, the Continents of the Americas, Africa, and the East remained hidden from us for some hundreds of years till methods of navigation were rediscovered, so I think it is the duty of surgeons to succeeding generations to chart their journeyings amongst the seas of disease, showing not only how, in certain waters and with certain bearings, they are able to accomplish their object in safety, but also showing those rocks on which their hopes foundered. Veau's classical treatise on the treatment of cleft palate is an ideal example. For this reason, I dare to place before you some experiences in the surgical treatment of the aged.

I have, with the help of my surgical registrar and house surgeon, reviewed the treatment of 496 consecutive patients over 65 years of age who underwent major surgical operations in six successive years. Their ages and the conditions that necessitated operation are noted in Table 1.

In the same period many operations in the younger age group were undertaken as happens in the ordinary routine of a general surgical unit. An operation mortality was taken as one that was due directly or indirectly to the operation. It is to be borne in mind that the average mortality of the populace in the age group 70 to 80 years is—males, 9.5 per cent.; females, 7.6 per cent. (Professor Stevenson), so that coincidences of expected cardiac failure coming on in the post-operative convalescence period can be expected. Despite this, a sudden cardiac failure in hospital was attributed to the operation.

The surgeon must use all his judgment in considering elderly patients. It is tissues, not years, that he is dealing with. Here the patient's general practitioner can give valuable advice. The mental outlook must be noted—a will to live and courage to bear the pain of coughing with an abdominal wound are good signs.

TABLE 1.

Major Operations.

Age	Prostate	Breast	Urinary Tract	Acute Appendix	Amputations	Gall Bladder	Stomach	Acute Intestinal Obstruction	Colon and Rectum	Total
65-69	57	17	7	10	0	22	19	14	10	156
70-74	73	16	5	1	6	14	5	27	10	157
75-79	43	4	3	4	10	7	8	15	6	100
80	42	1	7	4	8	4	2	11	2	81
90	1							1		2
Totals	216	38	22	19	24	47	34	68	28	496

If the patient, by some minor adjustment, can be relieved of his discomfort without operation, then an operation should not be advised; for example, an old man's reducible hernia can often be controlled satisfactorily with a truss. On the other hand, an irreducible hernia or a femoral hernia is not suitable for a truss, and operation should not be denied on account of age. Pain can often be eased by alcohol injections into nerves, ganglia, or placed intrathecally as necessary.

In hospital the patient should not be too much regimented. If he has lived to 75 or over he has probably found a way of life suited to him, and it should not be too crudely changed—especially diet. But it is possible he may have been depriving himself for some years of essential vitamins, especially "C" and "B," and these should be added to his diet. Some time in hospital should be spent to get him accustomed to his surroundings, nurses and doctors, so that he can undergo, to him, the great event of his life with confidence. This period helps the surgeon better to estimate the patient's general condition; signs such as rambling at night and disorientation are bad signs, and might not have been noted before. Patients often overwork, getting their affairs straightened, before coming in for operation and are physically and mentally tired, and need a few days' rest. I think the new phase applied universally, quick on to the operating table and quick out of bed, is a retrograde step. Quick out of bed is essential in cases of amputation and fracture of the femur. The patient should be exercised and made to stand on the sound limb to help it to retain its muscular power, for much of the success of the operation will be due to a strong limb on the unaffected or remaining side.

A good clinical examination is much more revealing than a host of laboratory figures. A dry tongue may show defective renal system and hypoproteinæmia may show as albuminuria. A poor cardiovascular system may show in moist lung bases or in the pulse. In old age the vital capacity is reduced. I regard poor aeration as

the chief cause of death. Chronic bronchitis in a patient with a sound heart will not necessitate abandonment of the operation if the patient has the courage to cough after operation, even if it hurts, and the anæsthetist does not depress the respiration too much and keeps his patient well oxygenated during the operation.

For successful oxygenation the hæmoglobin must be over 60 and no patient should come to an elective operation below this figure. In a surgical emergency the hæmoglobin is the best test, for it shows if there is hæmoconcentration and shock present. The blood pressure is not a true indication of early shock.

If it is admitted that

$$\text{Cardiac Output} = \frac{\text{Pressure}}{\text{Resistance}} \times K$$

$$\textit{or} \quad \text{C.O.} = \frac{R}{R} \times K$$

if R increases the pressure increases.

In shock R is increased due to increased viscosity of the blood following upon hæmoconcentration.

$$\therefore \text{C.O.} \times R\ (++) = P{+}{+} \times K$$

so that pressure only falls when the heart is failing.

A patient may look well, have a pulse of 70-80 and a satisfactory blood pressure, yet be in the first stage of shock. This must be corrected by transfusions before any operation is undertaken. An anæsthetic and operation undertaken when shock is present may make the condition irreversible.

A patient admitted with strangulated hernia had a pulse 72, but his hæmoglobin was 120 per cent. After transfuson the hæmoglobin dropped to 96 per cent. He then stood his operation well and made a good recovery. Another patient admitted with strangulated hernia had a pulse 80 with a hæmoglobin of 115 per cent. After transfusion the hæmoglobin was reduced to 88 per cent. This patient also made a good recovery. (See Table 10 on strangulated herniæ.)

In old people with wasting there is a marked loss of peripheral vascular reserve, although the venous bed remains the same. Hence one of the causes as to why old people bear emergencies very badly as shown by the high mortality figures for these conditions. Diarrhœa is a most serious complication and must be treated energetically by transfusions and drugs as kaolin, pectinate, streptomycin, and sodabicarbonate.

In the young with trauma and shock the pulse races faster and faster, but in the old, in shock, with the markedly developed blocking at the sino-auricular node the pulse is slowed down and keeps slow, only the kick of the pulse gets more feeble, and this is followed by missed beats, a grave sign.

Amputations.

The late Mr. T. S. Kirk used to teach that active bleeding and threatened gangrene were the only emergencies. Nowadays I think we can go further and say continuing hæmorrhage was the only true indication for immediate operation, the blood being restored by transfusions. We have antibiotics to control the

infection in gangrene, and operation can be planned. It is essential to wait in cases of strangulated gut to get the blood circulating volume and electrolytes restored before embarking on an operation. In gangrene of a limb a course of antibiotics will turn wet gangrene into dry gangrene and operation can then be undertaken safely. A course of antibiotics, coupled with copious fluid intake—even if necessary by transfusions—will remove toxæmia, and the stumps heal better and the patient stands the operation well. Cutler (1956), who urges immediate operation, records a mortality of 38 per cent., whereas in this series with the delayed operation the mortality is 23 per cent. I see no advantage then in deep freezing of the limb with risk of poor healing of stumps. One of our aged patients, when seen, had wet gangrene extending to the junction of the upper and mid third of the thigh. He was also delirious. He was treated conservatively by antibiotics, fluids by mouth, intranvenous salines and plasma. After two weeks the gangrene area became dry and his general condition improved so that he bore amputation at the hip joint with equanimity. When last heard of, he was sitting in judgment on his fellow-citizens as a juryman.

I personally like low spinal anæsthetics, 1.2 ml. of heavy nupercaine for amputations, not high enough to lower blood pressure. Sometimes, especially in diabetic gangrene, it is only necessary to do a local amputation of toes after infection has been overcome by the use of antibiotics. If done too early, before infection is overcome the infection may extend into the fascial spaces of the sole of the foot just as occurs in the hand. In diabetic gangrene of the foot, after antibiotic treatment has overcome infection and the diabetes is controlled, a below-knee amputation is often satisfactory, but in arterio-sclerotic gangrene it is usually necessary to amputate above the knee. One must aim at healing by first intention. Guillotine operations, oblique amputations or amputations with open flaps have no place in surgery of old people; if infection is controlled they are unnecessary and unsound treatment. Old people do not stand prolonged time in bed, the flaps contract, and there is the procedure of reamputating the bone with further danger of sepsis. The flaps should contain the muscle, with the anterior flap only a little longer than the posterior one. I see no disadvantage in a pneumatic tourniquet blown up before section. Cutting the posterior flap with transfixion after outlining the flap is a great advantage, as it prevents cutting a piece of the voluminous muscle twice and interfering with the blood supply to the peripheral skin. The muscles sutured over the bone ends keep the blood vessels of the flap taut and prevent the bone end pressing too heavily against the skin. There must be no tension; the skin edges should fall together and be accurately sutured. A small drain is placed to the bone end for drainage. Care is taken in bandaging that no pressure is placed against the end of the stump. Two to four days later the patient should have two crutches and be encouraged to stand, using his good limb. If left lying long in bed his good limb gets too weak to bear him.

The Urinary Tract.

The most common condition requiring surgical treatment in old men is in the urinary tract, the enlarged prostate accounting for most of the cases. In spite of

TABLE 2.

AMPUTATIONS.

AGES	NUMBER	DIED	CAUSE OF DEATH
65-69	0	–	
70-74	6	2	1 Broncho Pneumonia. 1 Coronary Thrombosis.
75-79	10	0	
80+	8	2	1 Broncho Pneumonia. 1 Coronary Thrombosis.
	24	4	

Two patients had to have the second limb off. One died one month later (wound broke down). The other died of cerebral vascular occlusion. =26 operations with 6 operative deaths=23 per cent. All but two were above knee amputations. There was one amputation at hip joint. Gangrene in old age shows disintegration of the cardiovascular system, and the death rate is heavy from cardiovascular lesions in vital areas.

writings to the contrary, I have no hesitation in recommending catheterisation in acute retention. If this cannot be done aseptically in a hospital I think it is time that hospital closed its doors.

Two-stage prostatectomy is still indicated, although with modern drugs and antibiotics we can do a closed one-stage prostatectomy more frequently than in earlier days. The suprapubic cystotomy should be done with local anæsthetic infiltration. I think a better and tighter suprapubic drain is got by inserting the De Pezzer through a Kidd's cannula after exposing the bladder. The tube is correctly placed when a squirt into the catheter in the urethra is followed immediately by a flow from the suprapubic tube. The patient can then be got up without leakage and encouraged to go for short walks. The second stage is only due when the patient is fit. If in a good home he improves wonderfully, going for walks and aerating his lungs. He should open his suprapubic tube every one to two hours and connect up to a bedside bottle at night. He should drink at least three quarts of fluid per day. Tubes should be changed at least every four weeks. When due for the first change a large Foley catheter in the suprapubic wound can replace the De Pezzer. It acts efficiently and is easily replaced. A sterile safety-pin placed through it prevents it moving to and fro carrying infection into the bladder. If with a suprapubic tube the patient complains of great frequency it means that the tube is too far in, touching the trigone or else there is a severe infection with trigonitis. Altering the position of the tube will determine which. If there is leakage round the tube it means the tube is blocked. When fit, prostatectomy is carried out by low spinal anæsthesia—not higher than the pubis and by local infiltration of the suprapubic wound. A light pack is placed in the prostatic bed for twelve to twenty-four hours and a tube, the size of the index finger, placed in the bladder. The bladder is drained by syphonage—this keeps his dressings quite dry and

minimises infection. The suprapubic tube is reduced in size till the wound is practically closed. As a rule, the patient is passing water normally in three weeks. Persistent suprapubic leakage means obstruction by fibrosis or a nodule of tissue at the internal meatus. The closing stage is a dangerous time and great care is necessary that there is no obstruction to outflow and that the urine is sterile or the patient under the appropriate bacteriocidal drug.

TABLE 3.

PROSTATECTOMY.

AGE	NUMBER	DEATHS	CAUSE OF DEATH
65-69	57	1*	Coronary Thrombosis and Uræmia.
70-74	72	1	One-stage operation. Congestive heart failure.
75-79	43	0	
80+	41	2	1 died two weeks late of Broncho-pneumonia. 1 congestive heart failure.
90+	1	0	
	214	4	
73	1		Transurethral Resection.
80	1	0	
	216	4	1.9 per cent.

One-stage operation was more common in the second period as shown.

1ST PERIOD			TWO-STAGE OPERATION		ONE-STAGE OPERATION
1st Period	1950/51/52	Proportion	4	to	1
2nd Period	1953/54/55	Proportion	1	to	5.2

*This patient had several previous coronary infarcts and in spite of suprapubic drainage his blood urea could not be reduced below 84 mg.

An attempt was made to relieve every case of retention of urine. A number of patients were unconscious with uræmia when admitted, who ultimately went on to successful prostatectomy. Cardiac cases were not refused, as it was felt the relief of urinary retention would benefit the cardiac muscle. In these very ill patients a suprapubic drainage was done under local anæsthesia and, when the patient's general health was improved, prostatectomy performed.

In one-stage prostatectomy Millen's method has been discarded as it has been found liable to be followed by fibrous stricture at the internal orifice, and the Wilson Hey type of operation is preferred. The three-way Foley catheter is used and a continuous drip of sodium-citrate is allowed to run into the bladder for two to three days. When there is no sign of enough blood in the urine to obstruct, the catheter is removed, and the patient is usually up in five days. The urine of these cases can be kept sterile throughout. This is contrary to some statements published recently.

TABLE 4.

Other Major Operations on Urinary Tract.

Age	Number	Operative Deaths	Remarks.
			Recovered from operative procedure but died after two months and within four months.
65-69	7	1 Exploration of malignant kidney	
70-74	5		1—Partial cystectomy and transplantation of one ureter.
75-79	3		1—Infected bladder and papillomata of bladder.
80	7		1—Partial cystectomy and transplantation of one ureter.
Total	22	1	3

Major Operations Performed other than Prostatectomy.

Renal Calculi	Vesical Calculi	Papilloma of Bladder	Carcinoma of Bladder		Strictures	Exploration of Kidney
			Cystectomy and Transplantation of Ureters	Transplantation Ureters		
2	5	5	3	5	1	1

TABLE 5.

Breasts.

Radical Mastectomies.

Age	Number	Deaths
65-69	17	0
70-74	16	0
75-79	4	0
80	1	1*
	38	1

*One anæsthetic death (hexamethonium). This patient had had a hemiplegia three years previously and had a high blood pressure. The operation was in the early days of the use of hexamethonium compounds.

Urethral resection of the prostate has been reserved for malignant cases. Double orchidectomy, leaving the epididymis, if the testicles are not atrophic, should be done as well as stillbestrol treatment.

The infiltrating carcinoma of the bladder wall in the old is at first often overlooked. In the early stages the complaint is frequency; in the male it suggests prostatic irritation and often after rectal examination and measuring residual urine the patient is reassured and given some urinary antiseptic. In the female the frequency is frequently put down to infection. Here careful vaginal examination of the base of the bladder may reveal the induration and be more easily demonstrated in this way than by the cystoscope. In the older age group the onset of persistent frequency not accounted for by infection or by a prostate raises the suspicion of an infiltrating carcinoma. Excision of the bladder or radiation of it, combined with transplantation of the ureters, at least relieves for a time. The more common carcinoma of the bladder is the adeno-carcinoma or the malignant papilloma more frequently associated with hæmaturia. The papillomata can often be kept under control for many years by diathermy through a cystoscope. These have more chance of radical cure by resection of the bladder. Old patients stand this and transplantation of the ureters well. The method of transplantation used has been a modified Coffey technique after a period of intestinal antiseptics. I have had no urinary leaks causing a mortality from this technique. Some hydronephrosis has frequently resulted from the transplantation.

Retention of urine in the aged female must be looked for. Urinary incontinence in the female, as in the male, may be just an overflow incontinence. Catheterisation is usually all that is required, but occasionally strictures of the female urethra are met with and a pessary that has been in the vagina untouched over twenty years has had to be removed.

Radical Mastectomy.

Radical mastectomy is well borne in the old. I still consider it is the method of choice. It leaves less disablement than a simple mastectomy if the tail of the breast is removed, and I cannot agree that the sub-scapular glands are left. In no case has there been a local recurrence which would be the case if these glands are left. Deep X-ray by an expert may be superior to a so-called radical mastectomy that is inexpertly and carelessly done. Radium and deep X-ray have their uses. I have seen better results from radium implantation than deep X-ray, but with modern apparatus and technique this may be reversed (Table 5).

The Gall Bladder and Bile Ducts.

On account of the poor vascularity and atrophy of muscles perforation of a viscus is more easily produced in old age, so that perforation of peptic ulcers, gall bladder and appendix is met with more frequently in the older age group.

In a series of gall bladder operations there was only one gall bladder perforation, but J. Cutler found eight perforations in twenty-eight acute cases. It is to be remembered that old people treat abdominal pains lightly and are inclined to try first home remedies like a purge, and this would hasten the perforation of a viscus. If an acute cholecystitis in an old person does not show signs of subsiding with

treatment in twenty-four hours it should be drained under local anæsthetic and thus avoid perforation with peritonitis. Cholecystectomy in the acute stage is contraindicated. Cutler gave a mortality of close on 60 per cent. for cholecystectomy in acute cases. Even with a stone in the common bile duct drainage of the gall bladder after gently extracting the stones from the gall bladder is efficient without interfering with the common bile duct. I have found this indirect drainage life-saving. Cutler stated that exploration of the common bile duct carried a mortality of 73 per cent. Many of these cases do not require a second operation and the bile channels can be easily viewed a week later by injecting radio opaque fluid into the gall bladder through the drainage tube. Severe cholæmia can be successfully treated by transfusions of glucose saline and plasma and, if infected, by adding antibiotics, varying the dose of the latter according to the renal output.

Gall stones in themselves are not an indication for operation, but an old patient who harbours gall stones and gets periodic attacks should—unless there are special contraindications—have the gall bladder removed in a quiet interval to avoid an emergency operation. It is as safe an operation in the aged as in the young.

TABLE 6.

OPERATIONS ON GALL BLADDER AND BILE DUCTS.

AGE		NUMBER		DEATHS
65-69	...	22	...	–
70-74	...	14	...	–
75-79	...	7	...	–
80+	...	4	...	–
		47		0

43 Cholecystectomies.
2 Cholecystduodenostomies
1 Cholecystgastrectomy.
1 Cholecystostomy.

Nine of these cases had stones in common bile duct. One case had ruptured gall bladder.

OPERATIONS IN THE STOMACH AND DUODENUM.

A patient with a hæmatemesis operated upon after a first transfusion does comparatively well compared with a patient who has been treated more conservatively and has had several transfusions before operation is decided upon. It is a good rule that a patient who gives a history of an ulcer and who has a hæmatemesis should be operated upon after blood transfusions have restored his hæmoglobin or in any case, if, after transfusions, he does not hold his hæmoglobin after having 500 ml. blood per eight hours for twenty-four hours. Elderly patients, on account of arterio-sclerosis, are less likely to stop bleeding than a young person. Cutler states : "The patients who died were not our oldest patients nor those most afflicted with incidental ailments but rather those who bled longest." It is best to prevent, if possible, emergency surgery by treating chronic ulcers of the

duodenum or stomach in the old by radical operation. Properly arranged, such operations reduce the mortality rather than increase it. Mielson found that 33 per cent. of deaths due to peptic ulceration were in patients over 60 years. Hæmatemesis in patients over 70 carries a mortality of 15.9 per cent. (Fraenkal and Truelove). Davey (1956) has recently published a series of thirty elective subtotal gastrectomies for chronic ulceration without a death; whereas published figures for emergency surgery in the old are in the neighbourhood of 40 per cent.

Our own figures for operations on the stomach are given in Table 7.

TABLE 7.

OPERATIONS ON STOMACH AND DUODENUM.

AGE	NUMBER
65-69 ...	19
70-74 ...	5
75-79 ..	8
80+ ...	2
	34

CHRONIC ULCERATION OF STOMACH.

14 Sub-total Gastrectomies - - -	0 deaths.
1 Gastroenterostomy - - -	0 ,,
15	0 deaths.

EMERGENCY OPERATIONS.

		DEATHS
Perforations - - -	6 ...	1
Acute Hæmatemesis - -	4 ...	3
	10	4

CARCINOMA OF STOMACH.

	DEATHS	CAUSE
1 Total Gastrectomy and Splenectomy and Partial Pancreatectomy - -	0 ...	
1 Total Gastrectomy and Splenectomy and Partial Pancreatectomy - -	1 ...	Coronary Thrombosis; 7th day.
3 Sub-total Gastrectomies - - -	0 ...	
3 Partial Œsophago-Gastrectomies -	2 ...	Leak at anastomosis.
1 Gastro-enterostomy - - -	0 ...	
TOTAL 9 operations.	3 deaths.	

ACUTE APPENDICITIS.

Acute appendicitis in the old is a grave responsibility to the surgeon. It carries a mortality of from 12 per cent. upwards. In Cutler's series it was 40 per cent.

The early pains are, as a rule, unheeded. The patient has probably tried to purge himself, with the result that, when admitted to hospital, eight out of nine are perforated with abscess formation or general peritonitis. Even when seen in the early stages the diagnosis may be difficult. There is little reaction on account of the low metabolic rate. Vomiting is unusual, the pulse rate is not above 80 per cent. and the temperature is not much raised. I consider a thermometer reading in the mouth of 98.4° a slight rise in temperature. Rigidity is not marked, but there is slight abdominal tumescence and tenderness on deep pressure are the main signs with frequently a furred tongue and fæcal smelling breath. When seen with the sudden pain of the perforation of the appendix and general peritonitis the condition may be mistaken for a perforated ulcer. Percussion of the abdomen will elicit most pain over the seat of the lesion. When a surgeon has any doubt as to whether the peritonitis is due to an ulcer perforation or an appendix he should always do a grid iron incision first. This is a life-saving measure. If it turns out to be a perforated ulcer it is a simple incision to close and no harm is done; whereas if a high abdominal incision is made and it turns out to be an appendix there is a great danger of losing the patient. The high incision gives more trouble with the chest. If the high incision has been made in a case of acute appendix it is better to start again and make a grid iron incision rather than enlarge the incision and try to drag a gangrenous appendix upwards. In ordinary circumstances appendicitis carries a higher mortality with a medial incision than with a lateral one. When the appendix is approached from the side the defensive mechanism of the omentum is not interfered with.

TABLE 8.

ACUTE APPENDICITIS.

AGES		NUMBER		DEATHS
65-69	...	10	...	1
70-74	...	1	...	0
75-79	...	4	...	2
80	...	4	...	0
		19		3

Mortality 15.8 per cent.
Out of nineteen cases fifteen had already perforated—79 per cent.
(Seven abscess formation; eight general peritonitis.)
History extended from twenty-four hours to two months.

ACUTE INTESTINAL OBSTRUCTION.

The common causes of intestinal obstruction in the older age groups are hernia, carcinoma of colon, bands, volvulus and gall stone ileus.

In the older age groups intestinal obstruction, due to malignant growths, play a large part. Obstructed and strangulated herniæ are other common causes. Intestinal bands, large gall stones and volvulus are not so common. The condition is always serious; more so if there is dilated small intestine. Obstruction confined to the large intestine does not produce shock so easily nor is it so marked.

Operation in all cases must be delayed till the blood circulating volume and electrolytes are restored to normal, even delaying operation up to twenty-four hours. As has been pointed out in a previous paper to this Society, the operation itself lowers the circulating body plasma by 10 to 15 per cent., and if it is already lowered by the obstruction it is possible to lower it to a state where it is irreversible. The hæmoglobin on admission gives a rough idea of the amount of shock. It is much more reliable than the blood pressure. Gastric suction and transfusion undertaken till the hæmoglobin is in the region of 70 to 80 per cent. will improve the condition. Local anæsthetic should be used in all external herniæ. An anæsthetist should stand by in case it is necessary to add to the local some general anæsthetic if widespread resection has to be undertaken. With local anæsthetic in intestinal obstruction there is less likelihood of regurgitation of stomach contents and chest complications.

TABLE 9.

AGES AND TYPES OF ACUTE INTESTINAL OBSTRUCTION.

AGE	CARCINOMA OF COLON	HERNIA	GALLSTONE ILEUS	ADHESIONS	GENERALISED CARCINOMA
65-69	7	7 (1)	0	0	0
70-74	18	6	1	0	2
75-79	6	6	0	2	0
80+	3	7	1	0	0
90+	0	1	0	0	0
TOTALS	34	27	2	2	2

Sixty-seven cases with twelve deaths—17.7 per cent.
Of these twelve deaths ten had advanced carcinoma, of which the obstruction was the terminal event. Four of them were beyond even any palliative procedure.

Thirty-six out of forty cases of acute intestinal obstruction were due to carcinoma of the large bowel when the external herniæ are excluded, i.e., 90 per cent. of cases of intestinal obstruction in patients over 65 years are due to carcinoma of the large bowel.

In obstruction of large intestine the most common cause is carcinoma. Thirty-five per cent. of growths of the pelvic colon are first seen as admissions with acute intestinal obstruction.

In the blown-up abdomen blind cæcostomy under local anæsthesia is a life-saving measure. If there is doubt a preliminary straight X-ray determines if the cæcum is dilated. Cæcostomy must be looked on as only a temporary expedient to deflate and should not be considered a substitute for colostomy. It only acts as a safety valve and does not produce proper drainage. It should be followed in seven to fourteen days by colostomy or resection of the affected area.

Ileo-sigmoidostomy is not reliable. For example: A patient, 80 years, had an acute intestinal obstruction due to carcinoma of the splenic flexure. An ileo-

TABLE 10.

Strangulated Herniæ.

Comparison of Results, 1932-42, with 1950-55 period.

	Immediate Operations, Belfast Hospitals, 1932-42			Delayed Operations and Transfusions, 1950-55	
	Ages		Mortality	Ages	Mortality
				All types	27 cases 1 death
Strangulated Inguinal Herniæ -	70+	...	23%	70+ to 80+	3.7%
	80+	...	53%		
Strangulated Femoral Herniæ -	70+	...	58%		
	80+	...	71%		

These figures show the benefit of delaying operation in acute intestinal obstruction till the electrolytes are restored by transfusions.

TABLE 11.

New Growths of Colon and Rectum.

Ages		Number
65-69	...	13
70-74	...	24
75-79	...	11
80+	...	4
		52

34 new growths of colon and four at recto-sigmoid were admitted on account of acute intestinal obstruction;
21 of these were not removable, i.e., 60 per cent.

Emergency Operations.

14 colectomies on acute cases with three deaths;
3 abdominal perineal resections done with one death (79 years).

Elective Operations on Colon and Rectum.

18 new growths of colon;
7 were not removable, i.e., 39 per cent.;
7 colectomies - - - 0 deaths;
4 abdominal perineal - - 0 ,,

Other Operations on Large Bowel.

Disease		Operation		Result
Ulcerative colitis (68 years)	...	Complete removal of colon and rectum in one stage.	...	Recovery.
Diverticulitis, perforated and peritonitis (86 years)	...	Drainage and colostomy.	...	Died.

sigmoidostomy was done. Due to effective valve action at the ileo-cæcal opening the obstruction was not relieved, and he became grossly distended two days later. He was delirious and had auricular fibrillation. Under local anæsthesia a cæcostomy was done and rapid deflation accomplished. Next day he had improved greatly and apologised for his behaviour the previous day. He continued to improve, and eight days later withstood the resection of the growth and an end-to-end anastomosis without disturbance. Here the cæcostomy was life-saving. That it is only a temporary expedient is shown by the patient, who had a distended abdomen due to a carcinoma in the pelvic colon. A cæcostomy was done. His acute symptoms were relieved, but he gradually got weaker, and four weeks later had difficulty in sitting up in bed. A colostomy was then performed. The growth was not removable. He got stronger, put on weight, and he went back to his work and worked for a further two years.

Old people stand elective colectomy or abdominal perineal resection well when properly prepared. Intestinal antiseptics not only help the healing, but are a preventive of shock. In acute volvulus of the colon a stomach tube passed per rectum and guided from above into the distended loop deflates it and simplifies the operation.

On account of the atony and poor intestinal musculature in the old, constipation is a common complaint, and patients with this complaint are frequently admitted as cases of acute intestinal obstruction and the hard masses of fæces may cause perforation, as the musculature and blood supply in the old are poor. Hard masses of fæces in the rectum may also, by irritating the mucosa, produce a type of diarrhœa and fæcal incontinence which is relieved by removing the mass. A detergent in an enema will break up the fæcal mass; dioctyl sodium sulphosussinate is suitable for this. Vitamin B complex in the form of yeast granules is the best laxative for the old. Prolapsus ani is a distressing complaint; the simple operation of Kirschner, in which a subcutaneous wire or nylon is tied around the anus tight enough to grip the index finger in the anal canal, will relieve the complaint.

The technique of any operation in the old is no different from that in the young, except that the surgeon must remember his tissues have a poorer blood supply, slower healing, and his patient will not survive any complications. There must be rigid asepsis, avoidance of crushing and bruising of tissues and meticulous apposition in sutured areas. As healing is slower, it is advisable to add linen or silk sutures to support absorbable catgut. The patient must be thoroughly prepared and often his condition can be much improved by preliminary blood transfusion. Vitamins, especially C and B, and a plentiful intake of fluids are necessary.

Post-Operative Treatment.

Shock, chest complications, thrombosis and embolism, and renal impairment are the chief dangers to be guarded against in the post-operative period. The patient's bronchial system should be sucked as dry as possible after operation. He should *not* be moved from the operating table till his hæmoglobin has returned to his previous normal. His breathing should be deep and voluntary. For this reason very light drugging in anæsthesia is absolutely necessary. Omnopon and

scopolamine is contra-indicated, shallow breathing brings on pulmonary collapse—an old patient had an ampoule of omnopon and scopolamine as premedication for his anæsthetic. His respirations were so depressed as a result that he was sent back to the ward without being given an anæsthetic or having any operation. He developed consolidation of both bases of his lungs and took some weeks to make a recovery. Prolonged low blood pressure encourages thrombosis. The intravenous drip should be continued in a serious operation, 2000 cc's of dextrose solution is usually sufficient for the first twenty-four hours. Back in bed, he should be urged to cough within a couple of hours—and periodically *made* to cough. In abdominal conditions his side and lower ribs should be firmly held to ease his abdomen and so encourage a deep cough; a firm binder over the lower ribs is helpful. The urinary output is watched carefully and retention guarded against. Movements of the patient's legs, especially dorsiflexion and plantar flexion of the feet and wagging his limbs with the knees straight, are practised. Each day the calves of the limbs and the groins are palpated for tenderness and if any is elicited anti-coagulant therapy instituted. With kindness, encouragement to stimulate the patient's courage and hope, the old patient does well; indeed, he may do better than a younger patient, for the fact that he has lived to an old age shows a tough constitution, and he has probably immunised himself against many infections. The old patient may still have a worthwhile function in this world. He is tough and resilient and when he has the unfortunate experience of illness, amenable to surgical treatment, it is the responsibility of the surgeon to bring him back to health.

These six years of wandering that have been charted here this evening have been very happy ones. This has been due to a crew bound together in the same endeavour and filled with the same loyalty—loyalty to the patients. Bad or careless work by any member would have endangered the whole undertaking. Constant laborious and seemingly unnecessary details have been ever cheerfully undertaken. I should like to mention especially the Nursing Sisters and their Staffs. Many owe their lives to their self-sacrificing care; and to their compassion some owe the peace and happiness that came to them in the evening of their lives. Much is owed to the House Surgeons and Registrars who were responsible for many emergency operations and who helped to supervise the post- and pre-operative care. The skill of the anæsthetists, the late Dr. Harold Jefferson, whose early death was a great loss to us; Dr. Marjorie Pollock and Dr. McErvel had much to do with the good results. The checking and editing of the charts and figures I owe to my present Registrar, Dr. Graham, and House Surgeon, Dr. Houston. Much of the operating and overseeing of patients, here recorded, has been done by my valued colleagues, Mr. Vincent, and more recently, Mr. Dales. I was glad to be a member of such a happy crew and am grateful to them for their help.

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